Understanding Dispatch Logic in the Initial Response Simulation (IRS) Module

Topic:

Dispatch Logic in the Initial Response Simulation (IRS) module.

Purpose

This paper describes how the Initial Response Simulation module (IRS) combines Fire Dispatch Level (FDL) and resource assignment data to define resource response to fire events. FPA refers to this combination of variables as Dispatch Logic.

Terms

Fire Dispatch Level: In the IRS module, a 3, 4, or 5-level system of fire danger assessment used to define the maximum number by type of resources that can be dispatched to a Fire Workload Area (FWA) when a fire occurs within that FWA. Fire Dispatch Levels (FDL) are set using a derived (BI + Crown spread) Burning Index (BI), Fire Intensity Level (FIL), Flame Length (FL), Rate of Spread (ROS).

Dispatch Logic: User-defined settings by FDL to represent the maximum number and type of resources sent to ignitions in the Initial Response Simulation (IRS) module.

Background

The IRS module requires Fire Planning Units (FPUs) to enter FDL, breakpoint, and dispatch logic data in order to model the number and types of fire resources to be used in containment simulation of each fire event within a Fire Workload Area (FWA).

- **Fire Dispatch Level (FDL)**: These data are analogous to National Fire Danger Rating System (NFDRS) climatic breakpoints used for fire business thresholds in Fire Danger Rating Operating plans. Fire planners enter the FDL and breakpoint for each FWA into the FPA application.

- **Dispatch Logic**: Based on the FDL and breakpoint data, fire planners enter dispatch logic information; the quantity and type of initial response fire resources for each FDL/breakpoint within an FWA.

Discussion

Fire dispatch levels are defined using a minimum of three or a maximum of five fire dispatch levels. The five levels are: 1 = Low; 2 = Moderate; 3 = High; 4 = Very High; and 5 = Extreme.

Once the number of FDLs has been set for each FWA, fire planners enter breakpoint values defining the upper limit for each FDL so the simulation has the fire danger index range for that

value. Each fire has a derived BI (BI + Crown spread), FIL, FL, ROS calculated for it. The breakpoint values per FDL allow simulated fires to be binned into the appropriate FDL based upon the derived BI, FIL, FL, or ROS. Regardless of the number of FDLs selected, FPA always populates the final FDL column with "MAX" to represent the highest calculated value.

FPU planners identify in dispatch logic the desired quantity of producer types for dispatch to a fire event occurring at each of the FDL (see Figure 1 for an example of a Dispatch Logic input screen). When enough resources are not available to fulfill the desired quantity of producer types for a fire event dispatch, the model will use as many as are available within those producer types. IRS utilizes the resource within a producer type with the shortest arrival time if more than the desired number is available for dispatch to an FWA. When the producer types with the shortest arrival time are already committed to another fire event, IRS automatically searches for the specified resource and selects the resource from the dispatch location with the next shortest arrival time. FPUs can use the dispatch logic definition for multiple FWAs.

When more than one resource of the same kind is housed in the same location, FPA uses an ASCII sort based on the resource ID. For example in a given FPU, E523 is a Type 5 Engine, E421 is a Type 4 Engine, and E495 is a State Type 4 Engine. If you want the State Engine to always be the first dispatched to a fire event, enter the following resource IDs into the Define Resources screen; 1E495, then E421, and E523. Engine 421 will be sent before E523 because the E is equal and a 4 is lower than a 5 in the ASCII sort. Since speed is the next sort, remember that Type 3 to Type 7 Engines all travel to a fire at the same rate of speed.

Fire planners may refer to their Fire Management Plans and/or associated plans (Fire Danger Operating Plans, Dispatch Pre-Attack Plans, or computer aided dispatch tools) for additional guidance on selecting appropriate dispatch logic data for each FWA.

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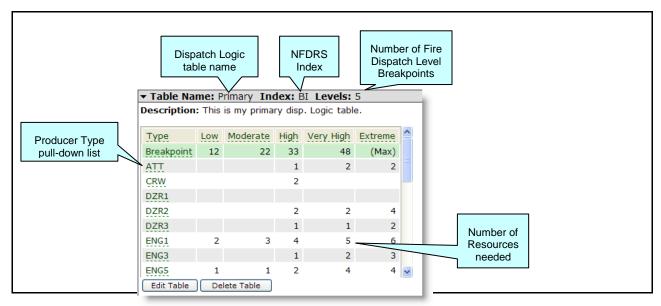# Understanding Dispatch Logic in the Initial Response Simulation (IRS) Module

	Dispatch Logic table name	NFDRS Index	Number of Fire Dispatch Level Breakpoints

Table Name: Primary **Index:** BI **Levels:** 5

Description: This is my primary disp. Logic table.

Type	Low	Moderate	High	Very High	Extreme
Breakpoint	12	22	33	48	(Max)
ATT			1	2	2
CRW			2		
DZR1					
DZR2			2	2	4
DZR3			1	1	2
ENG1	2	3	4	5	6
ENG3			1	2	3
ENG5	1	1	2	4	4

Producer Type pull-down list

Number of Resources needed

Edit Table   Delete Table

Figure 1: Example of a Dispatch Logic Input Screen